

## ABSTRACT OF THE DISCLOSURE

In a method of irradiating a gas cluster ion beam on a solid surface and smoothing the solid surface, the angle formed between the solid surface and the gas cluster ion beam is chosen to be between  $1^\circ$  and an angle less than  
5  $30^\circ$ . In case the solid surface is relatively rough, the processing efficiency is raised by first irradiating a beam at an irradiation angle  $\theta$  chosen to be something like  $90^\circ$  as a first step, and subsequently at an irradiation angle  $\theta$  chosen to be  $1^\circ$  to less than  $30^\circ$  as a second step. Alternatively, the set of the aforementioned first step and second step is repeated several times.